IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application for:	Examiner: Sharon, Ayal I.
Kapil D. Singh	Art Group: 2123
Application No.: 09/239,578	
Filed: January 28, 1999	
For: Method and Apparatus for Reusing Subparts of One Mechanical Design for Another Mechanical Design.	

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<u>Reply Brief</u>

Dear Sir:

This reply brief is submitted pursuant to 37 CFR §1.193 in response to the Examiner's Answer mailed July 30, 2003.

Issue Summary

I. Whether claims 1-26 contain subject matter which, under 35 U.S.C. §112, first paragraph, is described in the specification in such a way as to enable one skilled in the art to make or use the invention.

Claims 1, 6-8, 13-16, 21-23, and 25-26 stand or fall together as Claim Group I.

Claims 2-5, 9-12 and 17-20 stand or fall together as Claim Group II.

Claim 24 stands on its own.

- 1 -

Attorney's Docket No.: 109869-130041
Application No.: 09/239,578

IPG No. P007

II. Whether claims 1-7 and 25-26 are patentable under 35 U.S.C. §102 over Ansaldi.

III. Whether claims 1-2 and 25-26 are patentable under 35 U.S.C. §102 over Zeid.

IV. Whether claims 8-24 are patentable under 35 U.S.C. §103 over Ansaldi in view of Official Notice.

V. Whether claims 8 and 16 are patentable under 35 U.S.C. §103 over Zeid in view of Official Notice.

Issue I - Claim Group I

The Examiner's rejection of claims under Issue I – Claim group I has been withdrawn in the Examiner's Answer.

Issue I - Claim Group II

The Examiner's rejection of claims under Issue I – Claim group II has been withdrawn in the Examiner's Answer.

Issue I - Claim 24

In the Examiner's Answer, the Examiner maintained his rejection that "*a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instruction*" was not adequately described in the specification. Specifically, the Examiner states that the examples provided by the Appellant in the Appellant's previous arguments, *Bach* and *Cray*, which were provided in support of the position that multiple processes running on multiple processors is well known in the art, do not teach running of a single program on a multi-processor computer.

-2-

For clarification purposes, Appellant notes first that the claim does not preclude implementation of the first and second processor correspondingly executing the first and second plurality of programming instruction as separate programs. Nevertheless, Appellant respectfully submits that single program execution on multiple processor system was well known at the time of the present application.

The Examiner states that it is well known in the art that it is a non-trivial task to design a multi-threaded software application that can take advantage of the speed benefits provided by multi-processing. Appellant respectfully submits that an application writer does not need to manipulate the application to take advantage of multiple processors running a single application. Compilers have been in existence to provide for automatic parallelization of sequential programs. These provide for the ability of an application writer to write an application without the need to be cognizant of all the issues surrounding writing multithreaded applications (either user level or kernel level multithreading). The user can simply invoke command line options to a compiler and the compiler will perform automatic parallelization of an application during compilation to take advantage of multi-processor systems. See, for example, "Maximizing Multiprocessor Performance with the SUIF Compiler", Hall et al., (IEEE 1996).

Thus, Appellant respectfully submits that an application developer, at the time of the present application, was enabled to implement an application that included, at run time, "*a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions*".

- 3 -

Issue II - Claim Group III

With respect to claims 1 and 25-26, the Examiner has maintained the objection that:

> **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** and
> **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design"**

are both anticipated by *Ansaldi*. Specifically the Examiner argues that, upon close inspection of the two Face Adjacency Graphs (FAGs) that represent shells s and s' [in Figure 2(d)], that the FAGs of s and s' are duplicates of one another (albeit rotated 180 degrees). Assuming, arguendo, that the graphs have the same connectivity, it does not necessary follow that one of the graphs was replicated from the other. Moreover, as stated in the text accompanying the graph, "faces *f* and *f'* belong[ing] to two *different* shells *s* and *s'*, respectively". Thus, there is no indication that *s* or *s'* are replications of each other. In addition, the Examiner asserts that *s* is a FAG that represents a cube and that a rotated representation of a cube is still a cube. However, the fact that there are two FAG representations of a cube does not, absent specific teaching of a replication of one cube into another, imply that one cube is a replication of another cube.

The Examiner also states that, in Figure 2(d), it is taught that node *f'* is removed from shell *s*. Further it is stated that by removing the node *f'* from *s*, the resulting graph *s* after the removal of *f'* is a replicated subgraph of the original, pre-*f'*-removed, graph. Appellant respectfully submits that, by removing a node from a graph, the resulting

- 4 -

graph is the same graph as the original; it does not follow that a resulting graph with a node removed can be considered a "replicated subgraph" of the original graph.

In addition, the Examiner asserts that, the disclosure by *Ansaldi* that the decomposition of a FAG graph into biconnected and triconnected component allows recognition of special topological features, *Ansaldi* inherently teaches merging of subgraphs. However, merely because something can be recognized as having special topological features as part of its graphical representation, does not inherently teach **merging a replicated sub-graph into a second dependent graph of a second mechanical design**.

Finally, the Examiner states that the use of the plural in the phrase "recognition of special topological features of the object, like depressions, protrusions, handles or through-holes" implies replication of these features. Appellant respectfully disagrees. The use of the plural to describe the occurrence of features does not imply that any replication of a subgraph of a design has occurred, it is merely an indication that more than one of the items may occur; this is not an implication that any of the features are replications of the others.

Thus, for at least the reasons set forth above, the present invention is not anticipated by *Ansaldi*, and each of the independent claims 1, 25, and 26 is patentable over *Ansaldi*. Claims 2-7 depend from independent claim 1 incorporating its limitations. Thus, by virtue of at least their dependency on claim 1, claims 2-7 are patentable over *Ansaldi*.

-5-

Issue III - Claim Group IV

Claims 1, 25, and 26, in part, recite the limitations of **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** and the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**.

The Examiner asserts that *Zeid* teaches replicating a sub-graph from a first dependant graph of a first mechanical design. The Examiner points to the primitive definitions on page 392 where the Examiner asserts that certain primitive elements are equal to each other and that the nodes in the CSG corresponding to these equal primitive elements constitutes **"replication of a subgraph from a first dependent graph of a first mechanical design"**. Appellant respectfully disagrees.

In the discussion associated with Figures 7-41 and 7-42, primitives are used to construct a CSG representation (Fig 7-42) of a solid (Fig 7-41a). As part of this process, primitives are joined together to form intermediate solids (S_1-S_6). Thus, a graph (CSG) indicating how to construct a solid from primitives is provided. The Examiner asserts that, because several of the primitives used in the construction of the solid are the same, this implies a "replication of a subgraph from a first dependant graph of a first mechanical design". However, the nodes of the CSG are derived from the identified primitives themselves. Thus, to the extent that any items are "replicated" in the creation of the model of the design, it is the identified primitive components which are replicated and not any portion of a graph as, *prior to the creation of the first intermediate solid, there is no dependant graph.* In other words, all primitives are defined, prior to the

- 6 -

creation of any subgraph. Thus, there can not be said to be replication of a subgraph from a first dependent graph of a first mechanical design *as there is no subgraph when the primitives are duplicated.*

Moreover, as cited by the Examiner, the replication of a subgraph of the design comprises creating a copy of the identified dependent and independent nodes and their linking arcs (p. 11, lines 5-7). Assuming, arguendo, that there is a replication of a node associated with a primitive, there is no identification of nodes and linking arcs and creating copies of the identified nodes and arc.

Thus, for at least the reasons set forth above, the present invention is not anticipated by *Zeid*, and each of the independent claims 1, 25, and 26 is patentable over *Zeid*.

Claim 2 depends from independent claim 1 incorporating its limitations. Thus, by virtue of at least its dependency on claim 1, claim 2 is patentable over *Zeid*. In addition, claim 2 includes other limitations that render this claim further patentable over *Zeid*.

Issue IV - Claim Group V

As part of the basis for the Examiner's rejection of claim 8 of claim group V, the Examiner relies upon the previous argument that "*Ansaldi* teaches the creation and merging of graphs and sub-graphs as described in the claim, as discussed above". The Examiner additionally takes Official Notice that "it would have been obvious and well known to one of ordinary skill in the art to utilize a recordable medium …".

However, as discussed above, *Ansaldi* does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based. Assuming, arguendo, that it would have

- 7 -

been obvious and well known to one of ordinary skill in the art to utilize a recordable medium, claim 8 is nevertheless not obvious over *Ansaldi* in view of Official Notice as the basic elements upon which the rejection is based are not taught by *Ansaldi.* Thus, for at least the reasons set forth above, independent claim 8 is patentable over *Ansaldi* in view of Official Notice. Claims 9-15 depend from claim 8 incorporating its limitations. Thus, by virtue of at least their dependency on claim 8, claims 9-15 are patentable over *Ansaldi* in view of Official Notice.

Claims 16-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Ansaldi* in view of Official Notice. As part of the basis for the Examiner's rejection of claim 16, the Examiner relies upon the previous argument that "*Ansaldi* teaches the creation and merging of graphs and sub-graphs as described the claim". The Examiner additionally takes Official Notice that "it would have been obvious and well known to one of ordinary skill in the art to utilize a storage medium ...".

However, as discussed above, *Ansaldi* does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based. Assuming, arguendo, that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage medium, claim 16 is nevertheless not obvious over *Ansaldi* in view of Official Notice as the basic elements upon which the rejection is based are not taught by *Ansaldi.* Thus, for at least the reasons set forth above, independent claim 16 is patentable over *Ansaldi* in view of Offical Notice. Claims 17-24 depend from claim 16 incorporating its limitations. Thus, by virtue of at least their dependency on claim 16, claims 17-24 are patentable over *Ansaldi* in view of Official Notice.

Issue V - Claim Group VI

As part of the basis for the Examiner's rejection of claims 8 and 16 of claim group VI, the Examiner relies upon the previous argument that "*Zeid* teaches the creation and merging of graphs and sub-graphs as described the claims". The Examiner additionally takes Official Notice that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage/recordable medium.

However, as discussed above, *Zeid* does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based. Assuming, arguendo, that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage/recordable medium, claims 8 and 16 are nevertheless not obvious over *Zeid* in view of Official Notice as the basic elements upon which the rejections are based are not taught by *Zeid*. Thus, for at least the reasons set forth above, claims 8 and 16 are patentable over *Zeid* in view of Official Notice.

Conclusion

Appellant respectfully submits that claims 1-26 are patentable and requests that the Board of Patent Appeals and Interferences overrule the Examiner and direct allowance of the rejected claims.

Respectfully submitted,
Schwabe, Williamson & Wyatt, P.C.

Dated: 30 Sept , 2003

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- 9 -